EFFECT OF COMPUTERIZED ACCOUNTING INFORMATION SYSTEMS ON IMPROVING THE EFFECTIVENESS AND EFFICIENCY OF EXTERNAL AUDITING AT COMMERCIAL BANKS IN YEMEN

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1 Introduction

We live in a small town where businesses and organizations use modern information technology. Information expansion and maintenance are crucial, like physical and human resources. Thus, the present has prioritized information. In his remarkable work, Bouhaik defines an information system as a collection of data that has been organized and processed for user use. Accounting has grown as a system of information. A system is a group of pieces and interrelated components that work together to achieve a goal by receiving inputs and creating outputs (Abd El-basset Bouhaik, 2015; P 3). Three important AIS words are shown separately to explain the accounting information system based on them. First, "accounting" is business terminology for recording financial transactions. Decision-makers process "information," which is all financial activity data. The "system" is a unified entity with many aims (Alnajjar MIM, 2016). Kahalah (2002) states that the accounting system is essential for creating accounting information that rationalizes economic decisions that affect a community's wealth, resources, and people's well-being. The accounting system is closely related to several administrative activities, rationalizing decisions and improving efficiency. Computerized accounting information systems store, process, retrieve, and update accounting records. This method assures that the auditor's duties and tasks do not change, only the means and format of processing financial information, and allows efficient and reliable processing.

A computerized accounting information system can provide crucial, clear, and reliable information for decision-making and corporate success. Organizations and auditors must know their computer accounting systems and management information systems. Computerized accounting information systems help firms achieve their goals and make educated decisions.

Accounting information has certain characteristics that are defined by accounting rules and regulations to exhibit and recognize them. They also provide statistical and financial data in reports. The banking industry and other businesses can maintain operations by getting the help they need to operate and make choices. Thus, good accounting information systems are essential for justifying operational choices in

the banking business, helping management resolve challenges, and providing useful data to decision-makers with interest in the establishment's survival.

The AICPA defines financial accounting as "the art of recording, classifying and summarizing in a significant manner in terms of money, transactions, and events which are, in part at least of a financial character, and evaluating the outcomes thereof." The American Accounting Association (AAA) defines accounting as "the act of identifying, measuring, and disseminating economic information to permit informed judgments and decisions by users of the information." Accounting lists, categorizes, summarizes, analyses, and interprets financial transactions and communicates the results to relevant parties (Hiro, 2010).

Computerized accounting systems use EDP to record, process, retrieve, and update accounting records. EDP in accounting stores a lot of data. Payroll, purchases, creditor ledger, sales and cash books, debtor's ledger, inventories, fixed assets, financial analysis of profit projection or projecting cash flow and statement budgeting, capital investment, and others. Since computers rarely make mistakes, they improve accounting efficiency and accuracy. In auditing organizations with a computerized system, the auditor's tasks do not change until a mistake is caused by inaccurate data input. Instead, the means and form of processing money change (Hajar, 2014, p. 446).

Auditor skills and care are still required. The auditor must understand the management information system, notably the computer installation. The auditors should also obtain the computer installation's organization chart and data flow chart early in the audit to get a better understanding of the system. He should focus on internal control and internal check and make sure everything works well.

Auditor duties are unaffected by computers. The company's accounting record-keeping has changed. Despite the change in financial record-keeping, he must nevertheless give an honest assessment of the company's situation. To attain his audit aim, the auditor must improve his methods, techniques, and procedure.

Organizations must give valuable, clear, and reliable information to company decision-makers, especially management operations, to succeed. Thus, timely and accurate information leads to firm-beneficial decisions. Thus, information is crucial to

the business. Today, information is one of the company's most valuable assets. Thus, Accounting Information Systems should generate information for strategic and other decisions (AL-Jammal, 2014).

Accounting information systems have changed dramatically. IT advancements have shaped them. In contrast to traditional systems, they have included accounting information system concepts, scope, and goals. Thus, current AIS differs from traditional systems in occurrence place, supporting documentation, verification methods, tracing transactions, and more. From input to storage, modern AISs function electronically. Thus, accountants and traditional designers must understand how advanced technology affects AIS to adapt to a new world. Thus, accounting information systems now depend on information technology. Technology has become a key part of modern Accounting Information. Accountants and auditors must understand accounting information system technologies. Students should also understand how technology affects Accounting Information Systems (Hajar, 2014, p. 27).

All countries require accounting information systems tests for chartered accountant certificates, such as the American Institute of Certified Public Accountants CPA. The American Institute of Certified Public Accountants offers a Certified Information Technology Professional certificate (CITP) IT-savvy cadres get it.

For many years, accounting thought has seen increasing recognition and interest in the impact of environmental variables on the effectiveness of systems and accounting practices and their progress in various countries, so it is also necessary to have a framework within the organization that governs the components of the accounting information systems and coordinates their roles. Thus, most businesses require accounting data for diverse decision-makers at various levels. So, AIS is needed to handle all transactions and turn data into useful information to help top management and managers make financial and non-financial decisions.

Yemen's economy has grown rapidly since the 1990's reunification. Commercial banks are among the fastest-growing IT companies, which puts them and their systems under several system limitations. Yemen, a Middle Eastern country bordered by Saudi Arabia to the north and Oman to the east, was chosen for the study

due to its important location at the Bab El Mandeb strait. Yemen has 527,970 square kilometers of land and 29,825,964 people as of mid-2020, according to UN estimates (Al-Wazir & Zheng, 2012).

This study explores how computerized accounting information systems in Yemeni commercial banks affect external auditing effectiveness and efficiency. It focuses on Yemeni commercial banks and how these systems affect external auditing. The study focus on how data processing, record keeping, and reporting in computerized accounting information systems improve commercial bank external auditing. The study also examined Yemeni commercial banks' limitations and obstacles in deploying and using these technologies.

The study covers Yemeni commercial banks and their management and external auditors. This research chose executive managers, financial managers, account managers, accountants, and auditors because they understand accounting information systems techniques. Their banks' accounting information systems are planned, prepared, designed, implemented, and developed by them. Data was collected and analyzed quantitatively.

This research study is divided into six chapters:

Chapter I Introduction and research methodology: The importance and scope of the investigation, the formulation of the research problem, essential definitions of terminology, research objectives, hypotheses, the study framework, research methodology, and the creation of the questionnaire were all covered in this chapter's introduction to the study. This chapter also includes the study's shortcomings and its organizational structure.

Chapter II Literature Review: This chapter provides an overview of the literature on accounting information systems, computerized information accounting systems, audits, external audits, and the connection between these topics. The chapter begins with an introduction before going into great length about the pertinent literature, addressing many elements and perspectives. The main conclusions and findings from the literature review are then given in a summary and conclusion.

Chapter III Conceptual and Theoretical Framework: An overview of computerized accounting information systems and external audits in the banking industry was given in this chapter. It begins by outlining the ideas, significance, and goals of computerized accounting information systems as well as the benefits they offer. The chapter then moves on to talk about the elements that affect the adoption of computerized accounting systems and describes the many parts of these systems, including issues with security and safety. The second section of the chapter examines the principles, significance, and goals of external auditing as it pertains to the banking industry. The effectiveness and efficiency of this strategy are also discussed in the chapter, along with the elements that affect the acceptance of external auditing in a Computerized environment. In the chapter's concluding section, the theoretical underpinnings of Computerized accounting information systems and external auditing in the banking industry are discussed. These theoretical frameworks include contingency theory, resource-based view theory, agency theory, lending credibility theory, the theory of inspired confidence, signaling theory, and stakeholder theory. A summary of the main ideas addressed in the chapter is provided at the end.

Chapter IV A Summary of Computerized Accounting Information Systems (CAIS) in Yemen and its Neighboring Countries are presented: An introduction to Yemen and its banking system is given in this chapter. The evolution of commercial banks in the Republic of Yemen over time will also be looked at. The following section of the chapter will examine the various categories of banks in Yemen, their organizational structure, and the sources and purposes of their funding, including both commercial and Islamic banks. There will also be a discussion about the accounting and auditing profession in Yemen. The chapter also displays the CAIS in a number of close-by nations, including Jordan, Oman, Iraq, Saudi Arabia, the United Arab Emirates (UAE), Qatar, Kuwait, and Bahrain. There will be a comparison of Yemen's CAIS with that of its neighbors. A summary of the chapter will then be given.

Chapter V Effect of computerized accounting information systems on improving the effectiveness and efficiency of external auditing at commercial banks in Yemen: An empirical study: Data analysis, testing of hypotheses, and interpretation of the findings were covered in this chapter.

Chapter VI Findings, Conclusions, and Recommendations: This chapter covers the summary findings, conclusions, and recommendations for improving the efficacy and efficiency of external audits and bolstering the importance of accounting data in Yemeni commercial banks. The final section of this chapter offers ideas for additional study.

2 Statement of Research Problem

Auditors must deliver high-quality services due to the extensive use of electronic technologies and computerized application programs and the tremendous expansion in most economic sectors. Thus, this study addresses the following main question:

How do computerized accounting information systems improve external audit effectiveness and efficiency?

Sub-questions include:

1. Do computerized accounting information systems affect external audit effectiveness and efficiency?
2. Do computerized accounting information systems affect external audit offices?
3. Do external audit offices affect external audit effectiveness and efficiency?
4. Do external audit firms interact between computerized accounting information systems and external audit effectiveness and efficiency?
5. How may Yemeni commercial banks' external audits be improved?

3 Objectives of the Study

The main objective of this study is to understand the effect of computerized accounting information systems on external auditing effectiveness and efficiency. To achieve this objective, the following sub-objectives have been formulated:

1. To identify the most important concepts related to computerized accounting information systems and the most important external auditing concepts.

2. To provide an overview of Yemen, the banking system in the Republic of Yemen, and the computerized accounting information systems (CAIS) in neighboring countries of Yemen.
3. To investigate the relationship between computerized accounting information systems and external auditing effectiveness and efficiency.
4. To explore the relationship between computerized accounting information systems and external audit offices.
5. To examine the relationship between external audit offices and external audit effectiveness and efficiency.
6. To determine if the external audit office mediates the relationship between computerized accounting information systems and the effectiveness and efficiency of the external audit.
7. To come up with the most important findings and recommendations that facilitate the improvement of the effectiveness and efficiency of the external audit.

4 Hypotheses of the Study

To achieve the aims of the study and answer its questions, the following hypotheses have been formulated:

1. H1: There is a significant relationship between computerized accounting information systems and external auditing effectiveness and efficiency.
    - H1a: There is a positive relationship between computerized accounting information systems and the effectiveness of external audits.
    - H1b: There is a positive relationship between computerized accounting information systems and the efficiency of external audits.
2. H2: There is a significant relationship between computerized accounting information systems and external audit offices.
    - H2a: There is a positive relationship between computerized accounting information systems and external audit standards.
    - H2b: There is a positive relationship between computerized accounting information systems and the audit environment.
3. H3: There is a significant relationship between the external audit offices and the external audit effectiveness and efficiency.

- H3a: There is a positive relationship between the external audit criteria and the effectiveness of the external audit.
- H3b: There is a positive relationship between the external audit criteria and the efficiency of the external audit.

4. H4: External audit office mediates the relationship between computerized accounting information systems and the effectiveness and efficiency of the external audit.
    - H4a: External audit standards mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits.
    - H4b: External audit standards mediate the positive relationship between computerized accounting information systems and the efficiency of external audits.
    - H4c: Audit Environment mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits.
    - H4d: Audit Environment mediate the positive relationship between computerized accounting information systems and the efficiency of external audits.

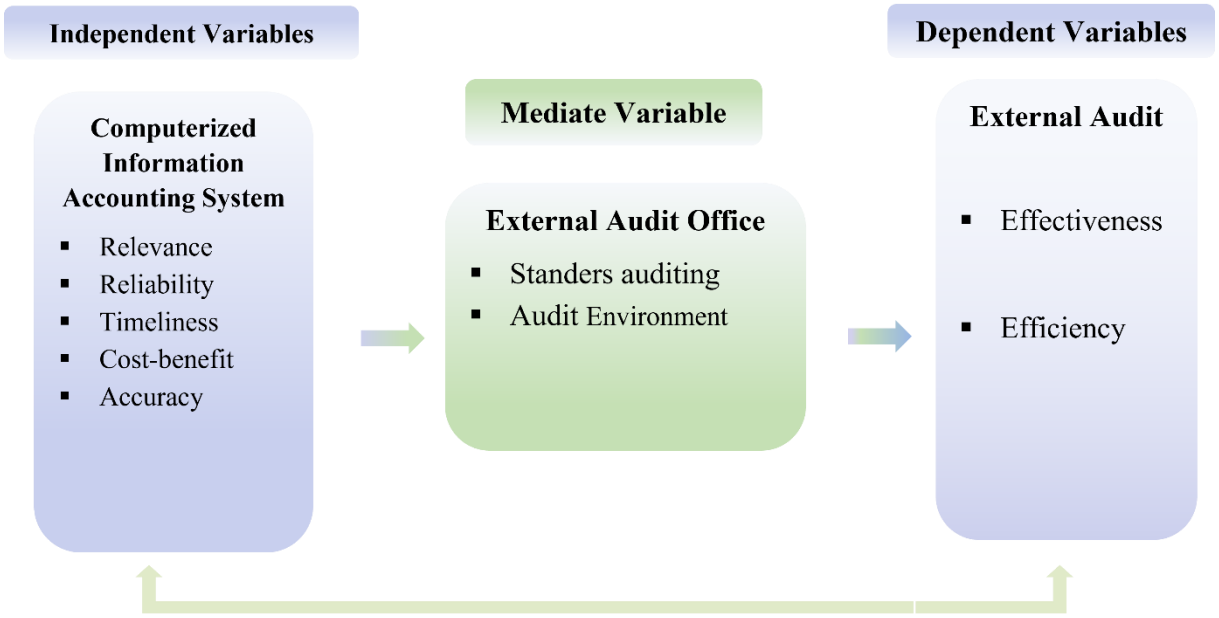
It should be noted that all of the above hypotheses are based on the assumption that computerized accounting information systems have a positive impact on the effectiveness and efficiency of external audits and that external audit offices play a crucial role in mediating this relationship. The study aimed to test and verify these assumptions by collecting and analyzing data from commercial banks and external audit offices in Yemen.

5 Model of the Study Framework

The study's model shows logical links between the research topic's variables or aspects. It simplifies data analysis and clarifies study variables. The researcher uses the variables and assumptions to build the model.

The following form depicts the study's model, which the researcher created by the variables supplied in light of the research topic and its hypotheses.

Figure 1:Model of the Study



Source: developed by the researcher

The study framework model shows computerized accounting information systems, external audit offices, and dependent variables (external audit effectiveness and efficiency).

Relevance, reliability, timeliness, cost-benefit, and accuracy comprise the independent variable, computerized accounting information systems. These sub-variables indicate essential elements of Computerized Accounting information systems that may affect external audit effectiveness and efficiency.

The external audit office mediates external audit standards and the audit environment. These sub-variables are likely to affect how computerized accounting information systems affect external audits.

Effectiveness and efficiency comprise the dependent variable (external audit effectiveness and efficiency). These sub-variables describe major outcomes likely to be altered by computerized accounting information systems and external audit offices.

6 Research Methodology

The study's research methodology section describes how data was collected and analyzed. It describes the study's paradigm, design, sample design, data sources, and instruments. It also explores statistical methods for data analysis. This section should be clear and straightforward for the viewers. The technique should be well-structured and logical, guiding the research process and addressing the study questions and objectives. The researcher must justify their approach choice. If other researchers want to reproduce it, it should be specified.

6.1 Research Paradigm

A research paradigm is a theoretical framework that guides a research study. It defines the underlying assumptions, beliefs, and principles that shape the research process and the interpretation of the results. The choice of research paradigm is important as it determines the methods and techniques used to collect and analyze data and, ultimately, the conclusions that can be drawn from the study (Johnson & Christensen, 2014).

In this study, the research paradigm chosen is positivism. Positivism is a research philosophy that emphasizes using scientific methods to study social phenomena (Saunders, Lewis, & Thornhill, 2009). It is based on the idea that the world is objective and external to the observer and that social phenomena can be studied using scientific methods such as statistical analysis and experimentation (Creswell, 2014).

Positivism was chosen as the research paradigm for this study as it is an appropriate framework for testing hypotheses and identifying patterns and relationships in numerical data. The study aims to investigate the impact of computerized accounting information systems on the effectiveness and efficiency of external auditing at commercial banks in Yemen. Using quantitative research methods such as surveys and statistical analysis, the researcher can test hypotheses and identify patterns and relationships in the data (Creswell, 2014).

6.2 Research Design

This study investigates how computerized accounting information systems affect external audits at Yemeni commercial banks. This research is quantitative. The researcher uses standardized questionnaires to collect data that can be examined statistically. Numerical data will be collected to test the study hypotheses. This design will allow the researcher to measure the output of Yemeni commercial banks' computerized accounting information systems, study the relationship between these systems and the effectiveness and efficiency of external audits, and identify the challenges and obstacles to their implementation.

6.3 Data Collection Methods

Table 1: Research Strategy for Data Gathering

Research Strategy	Description
Data Type	Primary and Secondary
Data Collection Method	Surveys and Documentation review
Data Collection Tools	Questionnaires, Literature Review
Sample Selection	Convenient sampling (purposive sampling)
Sample Size	Five employees from each branch or main center of the banks (executives, financial managers, account managers, accountants, and internal auditors,) in addition to the external audit offices

Source: by researcher

6.4 Sample Size for the Study

The study included all commercial banks in Yemen, consisting of 12 commercial banks. The sample included 206 branches and headquarters from which five employees were chosen from each branch or main center of the banks (executives, financial managers, account managers, accountants, and internal auditors). Thus, the study population of commercial banks is 1030 employees. Additionally, 382 external auditors were selected according to the statement of the Ministry of Trade and Industry 2020, which listed the audit offices permitted to practice the audit profession in Yemen.

The Evan Morris formula is used to calculate the sample size for a population when the population size is small, and it is based on the normal approximation to the hypergeometric distribution. This formula is suitable for populations with a size of less than 10,000, and it is beneficial for several reasons.

The sample size for the study is calculated using the Evan Morris formula, which is a method for determining the sample size for a population based on certain parameters such as the population size, population proportions, level of confidence, and accuracy of the sample proportions. In this case, the formula is used to calculate the sample size for commercial banks and auditing firms in the Republic of Yemen.

$$n = \frac{Nz^2pq}{(E^2(N-1) + z^2pq)}$$

- n is the required sample size
- N is the population size
- p and q are the population proportions.
- z is the value that specifies the level of confidence you want in your confidence interval when you analyze your data. Typical levels of confidence for surveys are 95%, in which case z is set to 1.96.
- E sets the accuracy of your sample proportions. If you want to know what proportion of individuals are in favor of some policy, with an accuracy of plus or minus 3%, then E is set to 0.03.

The size of the study sample in commercial banks in the Republic of Yemen

$$n = \frac{1030\times1.96^2\times0.5\times0.5}{(0.03^2(1030-1)+ 1.96^2\times0.5\times0.5)}$$

n = 525

For commercial banks, the population size is 1030, and the population proportions are assumed to be 0.5 for both p and q (assuming a 50/50 split of individuals in favor or against the topic being studied). The level of confidence is set to 95%, and the accuracy of the sample proportions is set to 0.03. Using these parameters, the sample size is calculated to be 525.

The size of the study sample in Auditing firms licensed and renewed to practice the profession of auditing approved in the Republic of Yemen

$$n = \frac{382 \times 1.96^2 \times 0.5 \times 0.5}{(0.03^2(382-1) + 1.96^2 \times 0.5 \times 0.5)}$$

n = 282

For auditing firms, the population size is 382, and the population proportions are 0.5 for both p and q (assuming a 50/50 split of individuals in favor or opposing the topic being examined). The degree of confidence is set to 95%, and the accuracy of the sample proportions is set to 0.03. These parameters yield 282 sample size.

Table 2:Distribution of Questionnaires

Sample Group	Sample Size	Targeted Number of Questionnaires	Retrieved Questionnaires	Missing Forms	Valid Forms for Analysis	Invalid Forms	Distribution Technique
Commercial Banks	525	950	723	227	534	189	Manual receipt and delivery
External Audit Offices	282	382	317	65	300	17	Google Forms (electronic)

Source: by researcher

The technique of delivering the questionnaire for this study involves a combination of human receipt and delivery for commercial banks and electronic distribution via Google Forms for external audit offices. Based on the Evan Morris formula, the sample size of the commercial banks that represent the study population was a total of 525 targeted, with the questionnaires being distributed to five employees (executives, financial managers, account managers, accountants, and internal auditors) were distributed 950 questionnaires. 723 questionnaires were retrieved, with 534 valid for analysis, 189 invalid, and 227 missing.

282 external audit offices were sampled. Google Forms distributed 382 questionnaires. 300 valid forms were received 17 invalids. A 23-person team distributed and collected Yemeni questionnaires. This strategy ensures a wide and representative sample for the study and raises the chances of achieving reliable results.

6.5 Data Analysis Methods

Frequency, percentage, mean, standard deviation, and correlation analyses were performed on questionnaire data. SPSS analyzed data. Regression, t-test, and ANOVA were used to test the study hypotheses. SEM is also used to assess research hypotheses and analyze variable relationships. SEM was also used to evaluate hypotheses about computerized accounting information systems, external audit offices, and external audit efficiency and effectiveness. This technique will help identify any hurdles or challenges affecting Yemeni commercial banks' external audits.

7 Summary of Research Articles Reviewed

A literature review summarizes the field's knowledge, discoveries, and theoretical and methodological advances. Novels and experimental work are not covered in literature reviews. A literature review critically evaluates relevant research articles. A literature review introduces readers to the latest theories and studies on a topic to help future research into undiscovered or understudied areas. Thus, this study examined several external audits and computerized accounting information system articles. Previous research underpins this study.

Table 3: Summary of Research Articles Reviewed

No	Articles related to	Number of articles reviewed
1.	Accounting Information Systems (AIS)	17
2.	Computerized Information Accounting Systems (CIAS)	35
3.	Audit	14
4.	External Audit	8
5.	CIAS and External Audit	7

Source: by researcher

CAIS can increase external audit efficiency and effectiveness; hence it should be examined. This literature research revealed no study on CAIS's impact on Yemeni commercial banks' external auditing effectiveness and efficiency. However, there is not much research on CAIS's impact on external audits from Jordan, Kenya, etc.

Yemeni commercial banks' computerized accounting information system and external audit efficiency and effectiveness gap. Thus, the research gap supports a study on how CAIS improves external audit efficiency and efficacy. The report is important because external auditors follow IT technology, including CAIS. If appropriately used, CAIS can help external auditors reduce risks and expectations gaps and identify the strengths and weaknesses of accounts entered by the CAIS used in the particular organization. The lack of a Yemeni study is the main reason for this study, especially for choosing commercial banks.

8 Findings of the Study

The key findings are in two sections. The first part of the study was a theoretical analysis of provirus literature, whereas the second half was a data analysis and conclusion.

8.1 Results from the theoretical section of the study

1. Authors and researchers stick to the fundamentals.
2. The accounting information system's efficiency and efficacy were ignored in favor of its practicality.
3. Regarding data quality, researchers and authors prioritize the organization over its subsystems.
4. Financial performance has been used to evaluate information systems; however, this strategy is insufficient.
5. Few scholars have examined how computerized accounting information systems improve commercial bank external audits.
6. Internal auditors' financial investigations provide credible evidence for external auditors' risk evaluations. Auditing helps Yemeni commercial banks identify hazards early.
7. Technology and accounting innovations help external auditors audit Yemeni commercial banks.
8. ICT adoption has enhanced efficiency and economic growth, and banking innovation is becoming more significant. CAIS provides reliable, timely data to assist financial institutions in making better decisions and operating more

effectively. CAIS employs EDP to maintain accounting records, which improves data accuracy and simplifies external audits. In other countries, CAIS is harder to use; however, some institutions invest in innovation to improve their products and strategies.

8.2 Findings of the Field Research Work

8.2.1 Results of the Demographic Characteristics of the Respondents

1. 83.9% of the 700 respondents were men. 134 (16.1%) women. According to the researcher, Yemeni society prefers women to work in education and health.
2. The responses were youthful and experienced 392 (47%) respondents were 30–39 years old. 276 (33.1%) were 40–49. 10.3% (86) were 50+, and 9.6% (80) were 20–29.
3. 74.9% of the sample had bachelor's degrees. Diploma holders numbered 41, representing 4.9%, post-graduates 123, 14.7%, and doctorates 42, 5.0%. Higher education and research lack government funding. The statistics showed that most of the sample has graduate degrees.
4. Of 834 responders, 109 (13.1%) were executive managers, 88 (10.6%) financial managers, 98 (11.8%) accounts managers, 139 (16.7%) accountants, 100 (12.0%) internal auditors, and 300 (36.0%) external auditors.
5. Of 834 responders, 50 (6.0%) have 0-2 years of experience in their current position, 95 (11.4%) have 3–5 years, 218 (26.1%) have 6–10 years, 222 (26.6%) have 11–15 years, and 249 (29.9%) have 15+ years.

8.2.2 Findings related to the Relevance of Computerized Accounting Information Systems.

A majority of the respondents agreed with the statements.

1. 795 (95.3%) of 843 respondents said CAIS gives accurate information.
2. 742 (89%) said CAIS gives needed information.
3. 526 (63.1%) agreed that CAIS avoided irrelevant details. 190 (22.8%) were neutral, while 107 (12.8%) disapproved.
4. 736 (79.2%) said CAIS helped them assess and display outcomes.

5. 717 (86%) agreed that CAIS processed financial transactions and events as expected.
6. 754 (90.4%) agreed that CAIS could store, manage, process, retrieve, and report financial data.
7. 749 (89.8%) said CAIS stored financial data in a secure accounting database.
8. 728 (87.3%) agreed that CAIS's configurable dashboards and reports gave financial information quickly.
9. 723 (86.7%) thought CAIS produced good financial reporting.

Thus, most respondents thought measuring Computerized Accounting Information Systems was relevant.

8.2.3 Measuring Computerized Accounting Information Systems Timeliness.

1. 725 (86.9%) agreed that CAIS in the bank had rapid input.
2. 637 (76.4%) said CAIS enabled acceptable input procedure changes.
3. 734 (86.8%) agreed that CAIS provided timely financial information to beneficiaries inside and outside banks.
4. 763 (91.5%) believed CAIS sped up facility performance.
5. Finally, 694 (83.2%) said CAIS was well-formatted for repetitive procedures.

Most respondents agreed with the statements.

8.2.4 Reliability of Measuring Computerized Accounting Information Systems

1. 719 (86.3%) believed CAIS covered all bank accounting.
2. 688 (82.5%) responders thought CAIS output was complete. 108 (12.9%) were neutral.
3. 718 (86.1%) said CAIS produced accurate results. 100 (12.0%) were undecided.
4. 713 (85.4%) said CAIS produces the latest financial reports. 102 (12.2%) were neutral.
5. 749 (89.9%) said CAIS improved decision-making.

Thus, the Reliability of Measuring Computerized Accounting Information Systems claims were strongly agreed upon.

8.2.5 Cost-Benefit of Measuring Computerized Accounting Information Systems

1. 708 (84.9%) respondents agreed that CAIS reduced bank overhead.
2. 700 (84%) thought CAIS offered cheaper financial reports.
3. 691 (82.9%) respondents believed CAIS covered all bank accounting operations.
4. 706 (84.7%) said CAIS maximized system resources.
5. 623 (74.7%) said CAIS was cost-effective because most programs used operating systems for years and needed a cheap upgrade. 153 (18.3%) were neutral.
6. 729 (87.4%) respondents agreed that CAIS reduced manual system expenses in the organization.
7. 751 (90.1%) said CAIS's faster record-keeping contributes to greater business at a lesser expense.

Thus, most respondents agreed with the Cost-benefit of Measuring Computerized Accounting Information Systems.

8.2.6 Measuring Computerized Accounting Information Systems Accuracy

1. 785 (94.1%) respondents believed CAIS produced accurate financial reporting.
2. 718 (86.1%) believed the CAIS determined system output correctness.
3. 683 (81.9%) said CAIS provided detailed financial reporting.
4. 750 (89.9%) said CAIS produced the needed financial reports.
5. 739 (88.7%) believed CAIS results could be verified.
6. 648 (77.7%) agreed that CAIS securely made accounting data easy for non-office workers.
7. 768 (92.1%) respondents said CAIS was always more accurate than manual accounting.

Thus, most respondents thought measuring Computerized Accounting information systems was accurate.

8.2.7 Audit Environment Effects on Measuring External Audit Offices

1. 731 (87.6%) respondents agreed that the bank considered the external auditor's office's size and activities when appointing it.
2. 768 (92.1%) said the bank chooses an external auditor based on reputation.

3. 623 (74.7%) respondents said the Office of the External Auditor used innovative technology.
4. 671 (80.5%) believed the Office of the External Auditor had an effective information sharing mechanism.
5. 724 (86.8%) of respondents agreed that the external auditor has trained and qualified auditors.
6. 677 (81.2%) thought the External Auditor had physical potential.
7. 689 (82.7%) respondents agreed that the External Auditor seeks skilled help.

Most responders liked Audit Environment on Measuring External Audit Offices.

8.2.8 Auditing Standards Effects on Measuring External Audit Offices

1. 693 (83.1%) of 843 respondents said the bank's external auditor applied the education, training, and experience acquisition criterion.
2. 743 (89.0%) also believed the bank's external auditor was impartial and independent.
3. 766 (91.9%) agreed that the external auditor takes professional care to review and report.
4. 721 (86.4%) said the external auditor planned the audit and fully supervised the assistants.
5. 728 (87.3%) said the external auditor studies and evaluates the internal control system.
6. 707 (84.8%) said the external auditor always gets enough proof.
7. 740 (88.7%) agreed that the external auditor's report clearly reveals if the financial statements were produced using widely accepted accounting principles.
8. 734 (88.0%) agreed that the external auditor reports that accounting rules have been consistently applied.
9. 721 (86.5%) respondents agreed that the external auditor discloses all financial data or references otherwise.
10. 707 (84.8%) agreed that the external auditor's report shows the financial accounts are unified.

Auditing Standards in Measuring External Audit Offices were well-received.

8.2.9 External Audit Effectiveness Results

1. 720 (86.4%) of 843 respondents agreed that the external auditor examined the bank's procedures and systems in relation to the activity's scale.
2. 644 (77.2%) agreed that the external auditor examined ways to provide information and use resources to meet the bank's goals.
3. 679 (81.4%) agreed that the external auditor studied and explained the final accounting to improve profitability and liquidity.
4. 642 (77%) said the external auditor always uses current technology in the final audit report. 162 (19.4%) were neutral.
5. 696 (83.4%) said the external auditor finds fraud, mistakes, and legal infractions.
6. 670 (80.3%) agreed that the external auditor's report always covers all current and prior year financial statement adjustments.
7. 628 (75.3%) agreed that the external auditor's report always helps the bank seize opportunities.
8. 659 (79.0%) agreed that the external auditor helps the bank report its goals and business performance.
9. 559 (67.0%) said the external auditor always helps the bank achieve its goals through customer satisfaction. 206 (24.7%) were neutral.
10. 707 (84.8%) said the external auditor always follows professional ethics and conduct.

Thus, respondents' perceptions of external audit efficacy were good.

8.2.10 External Auditor Efficiency

1. 735 (88.1%) respondents said the external auditor plans the audit correctly.
2. 716 (85.8%) agreed that the external auditor may transfer the results of an internal control system investigation and evaluation into a report for the bank's owners.
3. 694 (83.2%) agreed that the external auditor explains internal control system flaws and suggests improvements.
4. 665 (79.7%) agreed that the external auditor designs audit processes using professional expertise. 134 (16.1%) were neutral.

5. 571 (68.5%) agreed that the external auditor advises on achieving the bank's goals with given resources. 180 (21.6%) were undecided.
6. 558 (66.9%) said the external auditor helps allocate bank resources. 203 (24.3%) were neutral.
7. 553 (66.3%) agreed that the external auditor proposes bank material and human resource use. 23.9% (199) were neutral.
8. 672 (80.5%) agreed that the external auditor provides an objective technical opinion on financial accounts' fairness and sincerity to meet individuals' repeated wishes. 120 (14.4%) were neutral.
9. 714 (85.1%) said the bank always uses the external auditor's report for planning and follow-up.
10. 553 (66.3%) agreed that the bank's external auditor saves resources. 179 (21.5%) were neutral.

Thus, the majority of responders agreed with external auditor efficiency statements.

9 Hypotheses Testing

1. H1a: There is a positive relationship between computerized accounting information systems and the effectiveness of external audits.

Table 4:Multiple Regression Analysis for Relationship Between CAIS and Effectiveness of External Audits

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.580	0.125		4.641	0.000
	Relevance	0.138	0.042	0.125	3.254	0.001
	Reliability	0.148	0.041	0.141	3.643	0.000
	Timeliness	0.149	0.037	0.158	3.979	0.000
	Cost-Benefit	0.184	0.040	0.186	4.562	0.000
	Accuracy	0.211	0.040	0.207	5.262	0.000
R		**0.802**				
R-square		**0.643**				
F		**160.904**				
p		**0.000**				

Compiled from Primary Data Output of SPSS.

The regression equation is as follows:

Effectiveness= 0.580 +0.138*Relevance + 0.148*Reliability + 0.149*Timeliness + 0.184 * Cost-Benefit +0.211* Accuracy

Multiple Regression was run to predict effectiveness from Accuracy, Relevance, Timeliness, Reliability, and Cost-Benefit. These variables statistically significantly predicted effectiveness, F (5, 828) = 160.904, p< 0.0005, R2= 0.643. All five variables added statistically significantly to the prediction, p< 0.05. **The null hypothesis is rejected, and the alternate hypothesis, "There is a positive relationship between computerized accounting information systems and the effectiveness of external audits," is accepted.**

2. H1b: There is a positive relationship between computerized accounting information systems and the efficiency of external audits.

Table 5: Multiple Regression Analysis for Relationship Between CAIS and Efficiency of External Audits

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.502	0.146		3.432	0.001
	Relevance	0.014	0.050	0.012	3.290	0.772
	Reliability	0.240	0.048	0.208	5.050	0.000
	Timeliness	0.135	0.044	0.130	3.072	0.002
	Cost-Benefit	0.159	0.047	0.145	3.358	0.001
	Accuracy	0.291	0.047	0.259	6.211	0.000
R		**0.655**				
R-square		**0.429**				
F		**124.602**				
p		**0.000**				

Compiled from Primary Data Output of SPSS.

The regression equation is as follows:

Efficiency= 0.502 +0.014*Relevance + 0.240*Reliability + 0.135*Timeliness + 0.1159 * Cost-Benefit + 0.291*Accuracy

Multiple Regression was run to predict efficiency from Accuracy, Relevance, Timeliness, Reliability, and Cost-Benefit. These variables statistically significantly predicted efficiency, F (5, 828) = 124.602, $p < 0.0005$, $R^2 = 0.429$. Four variables added statistically significantly to the prediction, $p < 0.05$, except for one variable (relevance) where p=0.772. **The null hypothesis is rejected, and the alternate hypothesis, "There is a positive relationship between computerized accounting information systems and the efficiency of external audits," is accepted.**

3. H2a: There is a positive relationship between computerized accounting information systems and external audit standards.

Table 6: Multiple Regression Analysis for Relationship Between CAIS and External Audit Standards

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.827	0.130		6.368	0.000
	Relevance	0.229	0.044	0.206	5.211	0.000
	Reliability	0.142	0.042	0.135	3.375	0.001
	Timeliness	0.184	0.039	0.194	4.743	0.000
	Cost-Benefit	0.093	0.042	0.093	2.212	0.027
	Accuracy	0.169	0.042	0.165	4.072	0.000
R		**0.680**				
R-square		**0.462**				
F		**142.326**				
p		**0.000**				

Compiled from Primary Data Output of SPSS.

The regression equation is as follows:

Auditing standards= 0.827 +0.229*Relevance + 0.142*Reliability + 0.184*Timeliness + 0.093 * Cost-Benefit + 0.169 *Accuracy

Multiple Regression was run to predict Auditing Standards from Accuracy, Relevance, Timeliness, Reliability, and Cost-Benefit. These variables statistically significantly predicted auditing standards, F (5, 828) = 142.326, $p < 0.0005$, $R^2 = 0.462$. All five

variables added statistically significantly to the prediction, $p < 0.05$. **The null hypothesis is rejected, and the alternate hypothesis, "There is a positive relationship between computerized accounting information systems and external audit standards," is accepted.**

4. H2b: There is a positive relationship between computerized accounting information systems and Audit Environment.

Table 7: Multiple Regression Analysis for Relationship Between CAIS and Audit Environment

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.032	0.134		7.677	0.000
	Relevance	0.214	0.046	0.196	4.697	0.000
	Reliability	0.183	0.044	0.177	4.189	0.000
	Timeliness	0.100	0.040	0.108	2.479	0.013
	Cost-Benefit	0.149	0.043	0.153	3.446	0.001
	Accuracy	0.100	0.043	0.099	2.316	0.021
R		**0.630**				
R-square		**0.397**				
F		**108.854**				
p		**0.000**				

Compiled from Primary Data Output of SPSS.

The regression equation is as follows:

Audit Environment= 1.032 +0.214*Relevance + 0.183*Reliability + 0.100*Timeliness + 0.149 * Cost-Benefit + 0.100 *Accuracy

Multiple Regression was run to predict Audit Environment from Accuracy, Relevance, Timeliness, Reliability, and Cost-Benefit. These variables statistically significantly predicted Audit Environment, $F(5, 828) = 108.854$, $p < 0.0005$, $R^2 = 0.397$. All five variables added statistically significantly to the prediction, $p < 0.05$. **The null hypothesis is rejected, and the alternate hypothesis, "There is a positive**

relationship between computerized accounting information systems and Audit Environment," is accepted.

5. H3a: There is a positive relationship between the external audit criteria and the effectiveness of the external audit.

Table 8: Multiple Regression Analysis for Relationship Between External Audit Criteria and Effectiveness External Audit

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.645	0.108		5.956	0.000
	Audit Environment	0.346	0.032	0.341	10.980	0.000
	Auditing Standards	0.463	0.031	0.467	15.023	0.000
R		**0.738**				
R-square		**0.545**				
F		**497.834**				
p		**0.000**				

Compiled from Primary Data Output of SPSS.

The regression Equation is as follows:

Effectiveness of Audit= 0.645 +0.346*Audit Environment + 0.463*Auditing Standards

Multiple Regression was run to predict effectiveness from Auditing Standards and Audit Environment. These variables statistically significantly predicted effectiveness, F (2, 831) = 497.384, $p < 0.0005$, $R^2 = 0.545$. Both the variables added statistically significantly to the prediction, $p < 0.05$. **The null hypothesis is rejected,**

and the alternate hypothesis, "There is a positive relationship between the external audit criteria and the effectiveness of the external audit," is accepted.

6. H3b: There is a positive relationship between the external audit criteria and the efficiency of the external audit.

Table 9: Multiple Regression Analysis for Relationship Between External Audit Criteria and the Efficiency of the External Audit

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.511	.126		4.070	0.000
	Audit Environment	0.211	.037	0.188	5.769	0.000
	Auditing Standards	0.621	.036	0.567	17.359	0.000
R		**0.706**				
R-square		**0.498**				
F		**412.159**				
p		**0.000**				

Compiled from Primary Data Output of SPSS.

The regression Equation is as follows:

Efficiency of Audit = 0.511 +0.211*Audit Environment + 0.621*Auditing Standards

Multiple Regression was run to predict efficiency from Auditing Standards and Audit Environment. These variables statistically significantly predicted the efficiency of Audit, $F(2, 831) = 412.159$, $p < .0005$, $R^2 = 0.498$. All variables added statistically significantly to the prediction, $p < 0.05$.

The null hypothesis is rejected, and the alternate hypothesis, "There is a positive relationship between the external audit criteria and the efficiency of the external audit," is accepted.

7. H4a: External audit standards mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits.

Table 10: Squared Multiple Correlations between CAIS and Effectiveness of External Audits

Dimensions	Estimate
External audit standards mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits	0.53

Source: Compiled from Primary Data

The Squared Multiple Correlation is **the communality estimate for an indicator variable**. The communality measures the percent of the variance in a given indicator variable explained by its latent variable (factor) and may be interpreted as the reliability of the indicator. Here the value is 0.53

Thus, it is concluded that "External audit standards mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits."

8. H4b: External audit standards mediate the positive relationship between computerized accounting information systems and the efficiency of external audits.

Table 11: Squared Multiple Correlations between CAIS and Efficiency of External Audits

Dimensions	Estimate
External audit standards mediate the positive relationship between computerized accounting information systems and the efficiency of external audits	0.64

Source: Compiled from Primary Data

The Squared Multiple Correlation is **the communality estimate for an indicator variable**. The communality measures the percent of the variance in a given indicator variable explained by its latent variable (factor) and may be interpreted as the reliability of the indicator. Here the value is 0.64.

Thus, it is concluded that "External audit standards mediate the positive relationship between computerized accounting information systems and the efficiency of external audits."

9. H4c: Audit Environment mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits.

Table 12: Squared Multiple Correlations between CAIS and Effectiveness of External Audits

Dimensions	Estimate
Audit Environment mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits	0.58

Source: Compiled from Primary Data

The Squared Multiple Correlation is **the communality estimate for an indicator variable**. The communality measures the percent of the variance in a given indicator variable explained by its latent variable (factor) and may be interpreted as the reliability of the indicator. Here the value is 0.58.

Thus, it is concluded that "Audit Environment mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits."

10. H4d: Audit Environment mediate the positive relationship between computerized accounting information systems and the efficiency of external audits.

Table 13: Squared Multiple Correlations between CAIS and Efficiency of External Audits

Dimensions	Estimate
Audit Environment mediate the positive relationship between computerized accounting information systems and the efficiency of external audits	0.62

Source: Compiled from Primary Data

The Squared Multiple Correlation is **the communality estimate for an indicator variable**. The communality measures the percent of the variance in a given indicator variable explained by its latent variable (factor) and may be interpreted as the reliability of the indicator. Here the value is 0.62.

Thus it is concluded that "Audit Environment mediate the positive relationship between computerized accounting information systems and the efficiency of external audits."

The study found that all hypotheses were accepted, meaning there is a positive relationship between computerized accounting information systems and the effectiveness and efficiency of external audits, as well as external audit standards and audit environment. The mediating roles of external audit standards and audit environment in the relationship between computerized accounting information systems and the effectiveness and efficiency of external audits were also accepted.

Table 14:Summary of Hypothesis Analysis Results

No.	Hypotheses	Result
H1a	There is a positive relationship between computerized accounting information systems and the effectiveness of external audits.	Accepted
H1b	There is a positive relationship between computerized accounting information systems and the efficiency of external audits.	Accepted
H2a	There is a positive relationship between computerized accounting information systems and external audit standards.	Accepted
H2b	There is a positive relationship between computerized accounting information systems and environmental audits.	Accepted
H3a	There is a positive relationship between the external audit criteria and the effectiveness of the external audit.	Accepted
H3b	There is a positive relationship between the external audit criteria and the efficiency of the external audit.	Accepted
H4a	External audit standards mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits.	Accepted
H4b	External audit standards mediate the positive relationship between computerized accounting information systems and the efficiency of external audits.	Accepted
H4c	Audit Environment mediate the positive relationship between computerized accounting information systems and the effectiveness of external audits.	Accepted
H4d	Audit Environment mediates the positive relationship between computerized accounting information systems and the efficiency of external audits.	Accepted

10 Conclusion

The researcher draws a significant conclusion based on findings that have satisfactorily addressed the study's main difficulties and are backed by empirical research in Yemen's banking industry.

Researcher concludes.

1- The investigation showed that all Yemeni commercial banks use contemporary, integrated accounting information systems. The research also showed that these institutions train workers and have secure systems.
2- The study found that accounting financial reporting makes everyone pleased; thus, Yemeni banks must run smoothly and successfully. The accounting information system is accurate, secure, current, suited for all users, meets all demands, simplifies data flow between departments, reduces errors, and lowers expenses. The accounting system is inexpensive, and data can be entered, processed, and reports created quickly, saving time and money. Accounting information system efficacy and efficiency improve output quality.
3- The study's top factors affecting Yemeni banks' accounting information systems are:
    - Exact job descriptions of duties
    - Employee participation Accounting information system cost
    - Information system user training and senior management support
    - Hardware and software, ongoing training, and accounting standards
    - Information exchange between bank branches Legal norms and rules
4- The researcher found that the external audit's effectiveness and efficiency were achieved by using general standards and fieldwork criteria since the effective rate was positive. External audits depend on the audit environment. However, it is rarely or weakly applied.
5- The external audit standards and audit environment mediated the relationship between the independent and dependent variables. Analysis shows a full impact ratio.
6- After careful consideration, Yemeni commercial banks gain from external audits by establishing a strong governance framework. Yemeni commercial banks profit financially and from risk assessment by accepting such systems.
7- Internal and external audits of Yemeni commercial banks are affected by auditors' information. The activity makes internal auditing relevant. The work gives external auditors a concise financial overview of Yemen's commercial banks. It helps make auditing decisions.

11 Recommendations of the Study

According to the theoretical part of the study and its conclusion, it was vital to include some recommendations to help create any business's accounting information system to close any gaps in its use and comprehension.

1. Fully modernize Yemeni banks' accounting systems.
2. Consistently and regularly educate users to make it one of the bank's initiatives.
3. To continue training Yemeni bank workers on electronic systems.
4. To implement the accounting information system with skilled workers.
5. Public awareness and adoption of AIS must increase for it to be used effectively. Higher degrees of formal education, workshops, user training, and retraining are needed to improve.
6. Yemen's economic and technological environment requires modernizing accounting information system efficacy and efficiency requirements.
7. The government supervises and monitors the accounting information system.
8. External auditors must gather financial data properly.
9. The internal auditor's report and bank department data must be processed.
10. External auditors must calculate balance sheets and income statements correctly. Financial reports help external auditors assess commercial bank risk.
11. Processing helps external auditors identify report mistakes. Financial reports should also incorporate output determinations.

12 Suggestion for Further Research

The researcher suggested the following areas for future study:

1. Top management support and accounting information system effectiveness.
2. Accounting information system application factors.
3. How electronic commerce affects accounting information system performance.
4. Measure AIS's impact on accounting firms to assess its potential.
5. Increased accounting information system user knowledge.
6. Performance and risk management can be measured across Yemeni and international banks via external audit (capital adequacy of credit risk, market risk, operational risk, etc.).

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